gasification of the waste materials so as to produce the combustible gas. Due to the recovery of heat during the gasification process, the temperature in the fluidized-bed furnace can be controlled so that even when waste materials having high calorific values, such as plastic wastes, are gasified in the fluidized-bed furnace, valuable combustible gas can still be properly generated. Thus, the present invention is directed to a method and apparatus in which waste materials are gasified to form combustible gas, while heat is recovered to control the temperature during the gasification process.

In the Office Action of August 14, 2002, the Examiner asserts that the Ohshita reference discloses a furnace in which combustibles are gasified so as to generate combustible gas and non-combusted particles, and refers to column 7, lines 58-67 of the Ohshita reference as providing support for this assertion. In addition, the Examiner also asserts that the Ohshita reference discloses a heat recovery region 4, as discussed in column 6, lines 34-58. With respect to the remarks submitted by the Applicant on May 20, 2002, the Examiner asserts that simply because the Ohshita reference discloses that fuel *can* be completely burnt does not preclude that the fuel is not completely burnt. The Examiner also asserts that the gas exiting the fluidized bed-furnace of the Ohshita reference is "combustible gas", and refers to column 3, lines 27-30 in this regard. However, it is respectfully submitted that the Ohshita reference does not disclose or suggest a fluidized-bed furnace for gasifying waste materials so as to generate *combustible gas*, and does not disclose or suggest a heat recovery region in the fluidized-bed furnace for recovering heat during the gasification process.

As an initial matter, although the Examiner asserts that the Ohshita reference does not *preclude* the fuel from not being completely burnt, the Ohshita reference certainly does not teach that the fuel is gasified so as to produce *combustible gas*. In this regard, it is submitted that the Examiner's interpretation of the Ohshita reference is strained. In particular, the Examiner appears to refer to column 3, lines 27-30 as providing support for the Examiner's position that the furnace of the Ohshita reference produces "combustible gas." However, this section of the Ohshita reference describes an air chamber for imparting a high fluidizing speed and an air chamber for imparting a low fluidizing speed, which together impart a whirling flow to a fluidizing medium

within the primary combustion chamber. Nowhere in the section (or in the entirety of the reference) is the term "combustible gas" used or even implied. In contrast, the section spanning column 3, lines 39-42, explains that "*exhaust gas* is guided into a cyclone and particles collected in this cyclone are returned to a descending moving bed of the primary combustion chamber or the thermal energy recovering chamber" (emphasis added). In addition, the section spanning column 7, lines 58-67 explains that "*exhaust gas* is discharged from the boiler" (emphasis added). Although the Ohshita reference explains that "even coal with a high fuel ratio can be completely burnt" (column 7, lines 52-53), it is submitted that a reading of this passage within the context of the entire reference does not even imply, much less directly teach, that the furnace of the Ohshita reference gasifies waste materials to produce *a combustible gas*.

As further evidence that the Ohshita reference does not envision gasifying fuel to produce a combustible gas, the Examiner's attention is directed to column 7, lines 59-67. This passage teaches that any particles (i.e., solids rather than gases) that are not completely burned are separated by the cyclone 7 shown in Fig. 1, are introduced into a hopper 10, and fed back into the furnace 1 by the screw feeder 11. Thus, this passage implies that furnace 1 is intended to *completely combust* all of the material burned therein (even by re-burning particles, if necessary), and to eventually produce *exhaust gas* as shown in Fig. 1. As explained above, the Ohshita reference does not explicitly disclose or even imply gasifying materials to generate a combustible gas, and in fact explicitly teaches that the materials are to be *completely combusted* to form exhaust gas. Thus, the Applicants respectfully disagree with the Examiner's interpretation of the Ohshita reference, and it is submitted that the Ohshita reference does not disclose or suggest a fluidized-bed furnace that gasifies waste materials to generate *combustible gas*.

Further support for the fact that the Ohshita reference does not disclose or suggest a furnace for gasifying waste materials to produce a combustible gas is provided by the fact that the furnace of the Ohshita reference includes a heat transfer tube 5, as noted by the Examiner. Heretofore, one of ordinary skill in the art would not be motivated to recover heat from a gasification furnace because gasification is an endothermic reaction, and removal of heat from a gasification furnace tends to hinder or stop the endothermic gasification process. Specifically, in

order to perform gasification, it is necessary to maintain a minimum temperature in the gasification furnace. However, the endothermic gasification reaction causes the temperature in the furnace to lower. Therefore, removal of heat would make it extremely difficult to maintain the minimum temperature necessary for gasification so as to produce the valuable combustible gas.

Contrary to the Examiner's position, it is respectfully submitted that the Ohshita reference does not disclose or suggest gasifying waste materials in a fluidized-bed furnace so as to generate *combustible gas*, or recovering heat during the gasification process using a heat recovering region of the fluidized-bed furnace. In addition, the Hirayama reference also does not disclose or suggest a fluidized-bed furnace for gasifying waste materials to generate a combustible gas. Therefore, one of ordinary skill in the art would not be motivated to modify or combine the references so as to obtain the invention recited in claims 12-20 and 22-30. Accordingly, it is respectfully submitted that claims 12-20 and 22-30 are clearly patentable over the prior art of record.

In view of the above remarks, it is submitted that the present application is now in condition for allowance. However, if the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the Applicant's undersigned representative.

Respectfully submitted,

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